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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,984	01/21/2004	G. Paul Koning	EQLC-P01-003	5998
28120	7590	03/10/2006	EXAMINER	
FISH & NEAVE IP GROUP ROPES & GRAY LLP ONE INTERNATIONAL PLACE BOSTON, MA 02110-2624			DOAN, DUC T	
			ART UNIT	PAPER NUMBER
			2188	

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/762,984

Applicant(s)

KONING ET AL.

Examiner

Duc T. Doan

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-24 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/19/04 7/27/05.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-24 are in the application.

Claims 1-24 are rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7,10,14-19,20 rejected under 35 U.S.C. 103(a) as being unpatentable over MAshayekhihayekhi et al (US 2003/0074596) and in view of Umberger et al (US 6957433).

As in claim 1, MAshayekhihayekhi describes an apparatus for resource migration, comprising a storage system having a plurality of storage servers (MAshayekhi's Fig 1: #17) with a set of resources partitioned thereon (MAshayekhi's Fig 1: #16, #15), the claim further recites said storage servers having a load monitor process capable of communicating with other

load monitor processes for generating a measure of loading on respective ones of the plurality of servers; a resource migration process for transferring a resource from one of said plurality of servers to another of said plurality of servers in response to said measure of loading.

MAshayekhi does not describe the claim's detail of the server's processes. However, Umberger describes the storage systems (Umberger's Fig 5: #502A-#502N, correspond to the claim's storage servers) with multiple service components (Fig 5: #301-305) capable of measuring the service demands on workloads in the storage system (column 5 lines 35-63), and using the utilization information of storage systems to determine migrating the workload, for example from the high utilizing storage system to the low utilizing storage system (Umberger's column 9 lines 2-20; column 35-52). It would have been obvious to one of ordinary skill in the art at the time of invention to include the service components and procedures as suggested by Umberger in MAshayekhi's system to measure the incoming work request rates and calculating the utilization of components in a storage system thereby allowing dynamically balancing the workloads among the storage systems thus further optimize the performance of the overall system (Umberger's column 8 line 63 to column 9 line 20).

As in claim 2, the claim recites wherein said servers are equivalent to each other. Claim 2 rejected based on the same rationale as in the rejection of claim 1. MAshayekhi describes the servers A, B are operated in an equally manner to provide data to the initiator as separate nodes of servers in a cluster group (MAshayekhi's page 3 paragraph 23)

As in claim 3, the claim recites wherein said resources are selected from the group consisting of data blocks, program files, multimedia files, applications, and database files.

Umberger's column 8 lines 20-38 describe the work requests as an example for data blocks stored in a RAID storage system in a storage area network environment (SAN).

As in claim 4, the claim recites wherein said measure of loading reflects both a storage system load and a server load. The claim rejected based on the same rationale as in the rejection of claim 1.

As in claims 5-7,10 MAshayekhi's does not describes the claim's details of the storage system. However Umberger describes the claims' limitations as follows:

As in claim 5, Umberger's column 8 lines 35-40 describe wherein said storage system is a Storage Area Network.

As in claim 6, Umberger describes wherein the load monitor includes a process to determine whether a server is servicing a disproportionate share of the client requests being handled by a server group (Umberger's column 9 lines 10-20).

As in claim 7, the claim recites wherein the resource migration process includes a block data migration process. Umberger's column 8 lines 20-32, column 9 lines 10-20 describe as an example the migration of data for data blocks stored in a RAID of storage systems in a storage area network environment (SAN).

As in claim 10, the claim recites wherein the load monitoring process monitors one or more of network traffic load, I/O request load, storage traffic pattern type. Umberger describes the workload metric collector gathering the service demands rate (Umberger's column 5 lines 50-62).

Claim 14 rejected based on the same rationale as in the rejection of claim 1.

Claim 15 rejected based on the same rationale as in the rejection of claim 2.

Claim 16 rejected based on the same rationale as in the rejection of claim 4.

Claim 17 rejected based on the same rationale as in the rejection of claim 6.

Claim 18 rejected based on the same rationale as in the rejection of claim 7.

Claim 20 rejected based on the same rationale as in the rejection of claim 10.

Claims 8-9,11-13,19,21-24 rejected under 35 U.S.C. 103(a) as being unpatentable over MAshayekhihayekhi et al (US 2003/0074596), Umberger et al (US 6957433) and further in view of Ofek et al (6598134).

As in claim 8, the claims recite including a routing table for tracking resources maintained on the system (Ofek's Fig 2 data map/table); It would have been obvious to one of ordinary skill in the art at the time of invention to include the service packages, monitor routines and procedures as suggested by Ofek in MAshayekhi's system to keep track the changes of system's resource and thereby allowing migrating data in a transparent manner to the host (Ofek's column 6 lines 38-46).

As in claim 9, the claim recites wherein a pointer to a resource is maintained during an access operation to provide continuous data access. The claim rejected based on the same rationale as in the rejection of claim 8. Ofek further shows in Fig 2: #58 #64 address, pointer fields points to devices, volume, tracks.

As in claim 11, the claim recites wherein the resource migration process includes a further process to detect when a resource write request applies to a resource that is in the process of being moved from a first server to a second server, and apply such resource write request to both copies of the resource held at said first and said second server. Ofek describes in Fig 3 that

a write command received by the first storage system during the migration is also send to second storage system (Fig 3: #124 to #114).

As in claim 12, the claim recites wherein the resource migration process divides the resource being moved into smaller subresources, such that each subresource is moved from a first server to a second server in turn, and recovery from failure requires only the recovery of the subresource being moved at the time of failure and subsequent subresources. (Ofek describes using a tracking table to efficiently determine the data blocks to be restarting migrating process if a failure occurring during the migration process; Ofek's column 14 line 45 to column 15 line 6; Ofek further describes the background migration process is done in small chunks of data; column 15 line 35 to column 16 line 10).

As in claim 13, the claim rejected based on the same rationale as in the rejection of claim 11.

Claim 19 rejected based on the same rationale as in the rejection of claim 8.

Claim 21 rejected based on the same rationale as in the rejection of claim 9.

Claim 22,24 rejected based on the same rationale as in the rejection of claim 11.

Claim 23 rejected based on the same rationale as in the rejection of claim 12.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


When responding to the office action, Applicant is advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duc T. Doan whose telephone number is 571-272-4171. The examiner can normally be reached on M-F 8:00 AM 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DD


Mano Padmanabhan 3/2/01

Supervisory Patent Examiner

TC2188

MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER